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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,291	01/20/2006	Rodney A. Mattson	PHUS030241US	9784
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EXAMINER				
HO, ALLEN C				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/565,291

Applicant(s)

MATTSON ET AL.

Examiner

Allen C. Ho

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-16 and 18-22 is/are allowed.
- 6) ☒ Claim(s) 1,6-9,12 and 23 is/are rejected.
- 7) ☒ Claim(s) 2-5,10,11,13,24 and 25 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to because of the following informalities:

Claim 7 recites the limitation "the elements of the detector array". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

2. Claim 23 is objected to because of the following informalities:
3. Claim 23 recites the limitation "the radiation absorbing mask grid". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 6-8, 12, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi *et al.* (U. S. Patent No. 6,587,538 B2) in view of Adachi *et al.* (U. S. Patent No. 6,304,626 B1).

With respect to claim 1, Igarashi *et al.* disclosed a two-dimensional detector that comprises: an anti-scatter module (30, 130, 220, 230); a first alignment means for aligning the

anti-scatter module with a spatial focus (11) (The fact that the anti-scatter module is aligned with the spatial focus implies the existence of a first alignment means); a second aligning means (154, 173, 243) for aligning the anti-scatter module; a detector subassembly module, each detector subassembly module including a substrate (160, 171, 241) and an array of detector elements (163, 172, 242); wherein the second aligning means includes alignment pins (154, 173, 243) that aligns the anti-scatter module with the detector subassembly module (Figs. 5, 8A, 8B).

However, Igarashi *et al.* did not disclose a radiation absorbing mask formed as a grid and arranged between the array of the detector elements and the anti-scatter module.

Adachi *et al.* disclosed a two-dimensional detector that comprises a radiation absorbing mask (14) formed as a grid and arranged between the array of the detector elements and the anti-scatter module. Adachi *et al.* taught that the sensitivity of x-ray detecting elements drops abruptly in the vicinity of the edges, which may produce an artifact in a reconstructed image (column 1, lines 40-51).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a radiation absorbing mask formed as a grid and arranged between the array of the detector elements and the anti-scatter module, since a person would be motivated to produce a reconstructed image without artifacts.

With respect to claim 6, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 1, wherein the anti-scatter module includes: a plurality of anti-scatter vanes (Igarashi *et al.* 33, 133) formed of a material which is substantially absorbing for radiation produced by the radiography scanner (Igarashi *et al.*, column 4, lines 60-67).

With respect to claim 7, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 1, wherein the radiation absorbing mask includes: first strips parallel to the plurality of anti-scatter vanes, where first strips are equal or greater than a gap between the detector elements of the array (Adachi *et al.*, column 7, lines 33-49).

However, Igarashi *et al.* and Adachi *et al.* did not disclose first strips that are wider than a thickness of the anti-scatter vanes.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide first strips that are wider than a thickness of the anti-scatter vanes, since a person would be motivated to shield the edge of the detector elements as well as the gap between the detector elements.

With respect to claim 8, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 1, wherein the radiation absorbing mask includes: second strips perpendicular to the plurality of anti-scatter vanes, where the second strips are of substantial a same dimension as a gap between the detector element (Adachi *et al.*, column 7, lines 33-49).

With respect to claim 12, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 1, wherein the detector element array includes: a scintillator array (Igarashi *et al.* 43) that produces scintillation events responsive to radiation; and a photodetector element array (Igarashi *et al.* 160), each photodetector element of the array being arranged to view one of the scintillation elements of the scintillation array (Igarashi *et al.*, column 3, lines 38-55).

With respect to claim 23, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 1, wherein the radiation absorbing mask includes: a first plurality of strips

extending along a first direction; and a second plurality of strips extending along a second different direction (Adachi *et al.*, Fig. 9E).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi *et al.* (U. S. Patent No. 6,587,538 B2) and Adachi *et al.* (U. S. Patent No. 6,304,626 B1) as applied to claim 6 above, and further in view of Tang (U. S. Patent No. 5,949,850).

With respect to claim 9, Igarashi *et al.* and Adachi *et al.* disclosed the radiation detector as set forth in claim 6. However, Igarashi *et al.* and Adachi *et al.* did not disclose a radiation absorbing mask having stepped edges, which interleave with stepped edges of adjacent radiation absorbing masks.

Tang disclosed a radiation absorbing mask having stepped edges, which interleave with stepped edges of adjacent radiation absorbing masks (Fig. 2). Manufacturing a plurality of small radiation absorbing masks are preferred over manufacturing a large radiation absorbing mask because small radiation absorbing masks can be made accurately (column 4, lines 28-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a plurality of radiation absorbing masks having stepped edges for mating with adjacent radiation absorbing masks, since a person would be motivated to form a large radiation mask accurately.

Allowable Subject Matter

7. Claims 2-5, 10, 11, 13, 24, and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 14-16 and 18-22 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 14, the prior art discloses a computed tomography scanner that comprises: an x-ray source mounted to rotate about an examination region, the x-ray source emitting a cone shaped x-ray beam from a radiation focal point and traverse the examination region; a two-dimensional radiation detector which receives the cone beam that has traversed the examination region, the radiation detector including a plurality of detector modules, each detector module including: an anti-scatter module, a detector subassembly module aligned with the anti-scatter module, each detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and a radiation absorbing mask formed as a grid, the mask being arranged between and aligned with the array of detector elements and the anti-scatter module; and a reconstruction processor for reconstructing signals from the detector element array into a volumetric image. However, the prior art fails to disclose or fairly suggest an anti-scatter module including alignment pins, wherein the alignment pins of the anti-scatter module extend through alignment openings in the mask and alignment openings in the detector subassembly module as claimed.

With respect to claims 15, 16, and 18-20, the prior art discloses a method for manufacturing a radiation detector for a computed tomography scanner, the method comprises: aligning an anti-scatter module, which includes extending alignment pin, with a detector subassembly module including a substrate and an array of detector elements arranged on the substrate to detect radiation, and a radiation absorbing mask disposed between the anti-scatter module and the detector elements of the array. However, the prior art fails to disclose or fairly

suggest inserting the alignment pins through alignment openings in the mask and alignment openings in the detector subassembly module as claimed.

With respect to claims 21 and 22, the prior art discloses a radiation detector that comprises a plurality of detector modules, each detector module including: an anti-scatter module, including a plurality of vanes and alignment pins. However, the prior art fails to disclose or fairly suggest a rectangular grid that includes: a plurality of wider strips, arranged parallel to each other, each wider strip being wider than a width of each vane; and a plurality of thinner strips, the plurality of thinner strips being arranged perpendicular to the wider strips to form uniform openings, each wider strip is aligned with a corresponding vane as claimed.

Response to Amendment

10. Applicants' amendments filed 27 January 2009 with respect to claims 1-13 have been fully considered. The rejection of claims 1-13 under 35 U.S.C. 112, second paragraph, has been withdrawn.

Response to Arguments

11. Applicants' arguments filed 27 January 2009 have been fully considered but they are not persuasive.

With respect to the rejection of claims 1, 6, and 12 under 35 U.S.C. 103(a) as being unpatentable over Igarashi *et al.* (U. S. Patent No. 6,587,538 B2) in view of Adachi *et al.* (U. S. Patent No. 6,304,626 B1), the applicants argue that the mask (14) disclosed by Adachi *et al.*, being formed of strips that are arranged parallel to each other and extending along a single

direction, is not formed as a grid as recited in claim 1. The examiner respectfully disagrees. Adachi *et al.* disclosed an embodiment where the mask is formed of a two-dimensional grid (Fig. 9E). Therefore, the rejection is being maintained.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) El-Hanany *et al.* (U. S. Patent No. 7,339,176 B2) disclosed a radiation detector head.
- (2) Pohan (U. S. Patent No. 7,259,376 B2) disclosed a detector module.
- (3) Yokoi *et al.* (U. S. Patent No. 7,202,482 B2) disclosed a radiation detection apparatus.
- (4) DePuydt *et al.* (U. S. Patent No. 5,635,718) disclosed a multi-module radiation detecting device.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allen C. Ho/
Primary Examiner
Art Unit 2882

28 April 2009